

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

AVIDYNE CORPORATION,)
a Delaware corporation,)

Plaintiff,)

v.)

Civil Action No. 05-11098 GAO

L-3 COMMUNICATIONS AVIONICS)
SYSTEMS, INC., f/k/a B. F. GOODRICH)
AVIONICS SYSTEMS, INC., a)
Delaware corporation,)

Defendant.)

DEFENDANT'S MARKMAN CLAIM CONSTRUCTION RESPONSE BRIEF

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EXHIBIT LIST

- DX 1: U.S. Patent No. 5,841,018
- DX 2: Excerpts from *McGraw Hill Dictionary of Scientific and Technical Terms* (5th Ed. 1994)
- DX 3: Office Action dated 10-09-1997
- DX 4: Response Dated 03-02-1998
- DX 5: Office Action dated 03-23-1998
- DX 6: Excerpts from *Merriam-Webster's Collegiate Dictionary* (10th Ed. 1995)
- DX 7: Excerpts from *The American Heritage Dictionary* (3rd Ed. 1992)
- DX 8: Proposed Claim Construction Chart: Claim language and parties interpretation
- DX 9: Resume of Dr. Jonathan P. How
- DX 10: (Revised) Proposed Claim Construction Chart: Claim language, L3 Interpretation, Avidyne Pre-Brief Interpretation, Avidyne Brief Interpretation
- DX 11: *Manual of Patent Examining Procedure*, Chapter 2173.05(e)
- DX 12: *2 Patent Practice*, page 10 – 18 (5th Ed. 1993)
- DX 13: Faber, *Landis on Mechanics of Patent Claim Drafting*, § 23, pp. 50, 53 (3rd Ed. 1990)
- DX 14: 37 CFR § 1.72 (1995 and 1998 versions)
- DX 15: Expert report of Dr. Jonathan P. How
- DX 16: Expert report of Gary S. Watson

I. Introduction.

Avidyne Corporation (“Avidyne”) makes three fundamental errors in its approach to claim interpretation. Avidyne improperly attempts to (1) incorporate specific embodiments into its interpretations,¹ (2) impress a sequence restriction on the claims, and (3) usurp the role of the judge by focusing on conclusory extrinsic expert witness opinions instead of the intrinsic record.

As discussed herein, the specification is not to be elevated over the claim language (Section II), and an expert witness’ role in claim interpretation is limited (Section III). Further, the opening preamble clauses of the claims are claim requirements (V), additional features are not to be read into the claim requirements (Sections IV, VI-IX), and the order in which claimed operations are to be performed is not restricted to a particular sequence (Sections VII, VIII, XI).

II. Claims Are The Governing Feature of A Patent, Not The Specification.

Avidyne incorrectly elevates the specification over the claim language and repeatedly adds new limitations that do not appear in the claims. The proper approach to claim interpretation was laid out by the Court of Appeals for the Federal Circuit in its recent *en banc* decision, *Phillips v. AWH Corp*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). As a starting point, the *Phillips* court confirmed that it is a “bedrock principle of patent law” that the claims of a patent define the invention. *Phillips v. AWH Corp*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). “[T]he construction of claims is simply a way of elaborating the normally terse claim language: in order to understand and explain, but not to change, the scope of the claims.” *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1580 (Fed. Cir. 1991). Claim

¹ Counsel for L3 and Avidyne engaged in exchanges of claim interpretations. L3’s initial Markman Claim Construction Brief was based upon Avidyne’s last-stated position. Avidyne’s claim interpretations argued in its Brief, however, are different than those last represented to L3 and, as a result, render certain of the arguments contained in L3’s opening brief moot. To avoid any confusion which may arise from these varying positions, attached as DX 10 is a chart listing (1) the language of claims 1 and 16, (2) L3’s interpretations, (3) Avidyne’s last stated pre-brief interpretations, and (4) Avidyne’s interpretations as briefed.

interpretation is simply an effort to determine what the claims would mean to a hypothetical person of ordinary skill in the art. *Phillips*, 415 F.3d at 1313.

Claim interpretation is not an opportunity to rewrite the claims to include limitations from the specification, as Avidyne attempts. In fact, the governing law makes it clear that the Court may not include additional limitations during the claim interpretation process. *Phillips*, 415 F.3d at 1323; *Burke, Inc. v. Bruno Independent Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999).

Avidyne's characterization of the patented method is telling. Avidyne states (inaccurately) at page 7 of its brief that "the '018 Patent *requires* the following steps," as compared to saying (accurately) that the patent "discloses embodiments having those steps." Avidyne then recites a litany of specifics cited from the specification with but a single citation to the claims. This approach turns claim interpretation on its head. "Consistent with its scope definition and notice functions, the claim requirement presupposes that a patent applicant defines his invention in the claims, not the specification. After all, the claims, not the specification provide the measure of the patentee's right to exclude." *Johnson & Johnston Associates, Inc. v. R.E. Service Co.*, 285 F.3d 1046, 1052 (Fed. Cir. 2002).

III. An Expert's Role in Claim Interpretation Is Limited.

Avidyne appends to its brief an expert report of Marshall H. Kaplan consisting of a collection of conclusory definitions. Such conclusions are the role of the judge, not an expert. "Conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court." *Phillips*, 415 F.3d at 1318.

The intrinsic evidence, the patent itself and its prosecution history, is the most significant source of the legally operative meaning of disputed claim language. *Gillette Co. v. Energizer*

Holdings Inc., 405 F.3d 1367, 1370 (Fed. Cir. 2005); *Phillips*, 415 F.3d at 1317; *Vanderlande Industries Nederland BV v. ITC*, 366 F.3d 1311, 1318 (Fed. Cir. 2004). The patent claims provide the important function of public notice. “[U]ndue reliance on extrinsic evidence [such as expert testimony] poses the risk that it will be used to change the meaning of claims in derogation to the indisputable public records consisting of the claims, the specification and the prosecution history, thereby undermining the public notice function of patents.” *Phillips*, 415 F.3d at 1319.

Although extrinsic evidence may be considered, it is less reliable and relevant than intrinsic evidence, since by definition extrinsic evidence is not part of the patent and was not “created at the time of patent prosecution for the purpose of explaining the patent’s scope and meaning.” *Phillips*, 415 F.3d at 318. In particular, “expert reports and testimony is generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Phillips*, 415 F.3d at 318.²

Given the relationship between intrinsic evidence and expert testimony in claim interpretation, the role of an expert is extremely restricted. As explained in *Phillips*, 415 F.3d at 1318, expert testimony may be useful in certain areas:

- (1) To provide background on the technology at issue,
- (2) To explain how an invention works,
- (3) To ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or
- (4) To establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.

Dr. Kaplan’s conclusory report is not directed to these areas, and Avidyne has indicated an intention of introducing expert testimony at the hearing. L3 has focused on intrinsic evidence

² Although dictionaries technically constitute extrinsic evidence, dictionaries are somewhat different in that a dictionary definition has the value of being an unbiased source accessible to the public in advance of litigation and may be consulted by the Court at any time while construing claim terms. *Phillips*, 415 F.3d at 1322-23.

and dictionaries; however, in the event the expert testimony introduced by Avidyne at the hearing should require response, L3 appends hereto expert reports of Dr. Jonathan P. How (DX 15) and Gary S. Watson (DX 16).

IV. An “Attitude Determining Device” Is Not Limited To Sensors and a Processor.

L3 interpretation: The claim requirement of “attitude determining device” is interpreted as “a piece of equipment that determines angular orientation relative to the earth frame and is used to establish the attitude of a craft.”

Avidyne interpretation: “A device that includes sensors and a processor for processing the output of the sensors to determine attitude.”

Avidyne opens its argument with the acknowledgement that “the parties have agreed that ‘attitude’ is an angular position, and thus *an attitude determining device is a device that determines the angular position.*” (Avidyne brief, page 8; emphasis added.)³ This admission is completely consistent with L3’s interpretation, and is also consistent with the specification’s broad statement that “Attitude determining devices for mobile craft, like aircraft, for example, measure the attitude of the moving craft with respect to an outside reference coordinate system, typically known as earth frame.” (DX 1, Col. 1: 15 – 18; See DX 1, Col. 1:29-31). Despite these acknowledgements, however, Avidyne attempts to add subcomponent structural limitations -- sensors and a processor -- to the “attitude determining device,” apparently as part of its larger effort to improperly restrict the ‘018 claims to a specific performance sequence. (*See infra* at pages 8 - 15.)

There is no indication in the claims, the specification or the prosecution history that the term “attitude determining device,” must include these subcomponents (although it certainly may include them), and Avidyne’s suggestion to the contrary is incorrect. Avidyne’s conclusory

³ Avidyne inaccurately refers to “position” rather than the correct “orientation.” As discussed in L3’s initial Markman Claim Construction Brief at pages 20 and 22, this is incorrect because “position” implies a particular location of the attitude determining device within the craft, whereas “orientation” relates only to the attitude of the device.

statement on pages 8 – 9 of Avidyne’s brief provides no basis for reaching into the described embodiments and incorporating specific subcomponents into the claim, and Avidyne’s attempt to do so is error.

V. The Opening Preamble “Compensating for Installation Orientation of an Attitude Determining Device” Is a Necessary Claim Element.

L3 interpretation: The claim requirement of “compensating for installation orientation of an attitude determining device” is interpreted as “adjusting to neutralize the effect of the orientation of an attitude determining device as installed.”

Avidyne interpretation: None provided; the preamble needs no interpretation.

The issue of whether a preamble acts as a limitation normally arises in the context of claims to a structural article, with the question being whether the preamble is a “structural limitation” or is merely a function that results from the structure. *See, e.g., Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). With method claims, such as in the ‘018 patent, the claim elements are by definition functional and typically the preamble states the very reason the steps are performed. *See, e.g., Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003):

[P]reamble language will limit the claim if it recites not merely a context in which the invention may be used, but the essence of the invention without which performance of the recited steps is nothing but an academic exercise. [citation omitted] *This principle holds true here, as it frequently does for method claims...*

Id. (emphasis added).

The claim requirement above is contained in the identical preambles of claims 1 and 16.⁴ The preamble was used in both the specification and prosecution to distinguish over the prior art, and that use alone establishes the preamble as a limitation. *See, e.g., In re Cruciferous Sprout Litigation*, 301 F.3d 1343, 1347 (Fed. Cir. 2002); *General Electric Co. v. Nintendo Co.*, 179 F.3d

⁴ Prior to briefing, Avidyne stated the preamble did not require interpretation since it is not a claim limitation. This suggestion is an effort to negate consideration of the preamble in evaluating the claim, and thus increase the relevance of the prior art for use in subsequent defenses.

1350, 1361 (Fed. Cir. 1999). In the ‘018 patent the preamble also serves, at least in part, to define the invention in requiring “compensating for installation orientation of an attitude determining device ...to obtain attitude information *of* said craft *from* said device *based on* an earth frame coordinate system.” (DX 1, Col. 5:61-63, Col. 8:3-5; emphasis added).

Here, the preamble in its entirety provides the reason for undertaking the recited operations, as opposed to existing as a collection of “academic exercises,” *Griffin v. Bertina*, 285 F.3d 1029, 1033 (Fed. Cir. 2002), and the preamble constitutes a claim element and limitation to the ‘018 patent.

VI. “Sensing” Includes the Attitude Determining Device Itself Detecting Angular Orientation.

L3 interpretation: The claim requirement of “sensing the installation orientation of said attitude determining device with respect to said earth frame coordinate system when said craft is at rest to obtain a static orientation measurement of said device” is interpreted as “detecting an angular orientation with the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of said device.”

Avidyne interpretation: “Automatically determining the angular position of the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of the device.”

Avidyne effectively admits that L3’s interpretation of this claim requirement is correct. Avidyne concedes that the ordinary and customary meaning of the word “sensing” is “to *detect* automatically.” (Avidyne brief, page 10; emphasis added.) Prior to initial briefing, both parties agreed that “sensing” involved “detecting,” yet Avidyne now proposes, without explanation for its reversal, an interpretation that does not reference “detecting” at all. Moreover, there is nothing in the claims that would require “automatic” sensing without any operator activity. Although the claim is broadly stated and would encompass automatic activity, it is not so restricted.

Avidyne suggests the sensing step (1) includes “automatically determining” angular “position,” rather than “detecting” an angular “orientation,” and (2) does not require use of the attitude determining device itself. These suggestions are unsupported. Avidyne apparently hopes that (1) its interpretation of “determining” will impliedly include a “computation,” so as to assist in Avidyne’s later argument that a particular sequence is required, and (2) its insertion of “automatically” will exclude any activity involving an operator. In addition, Avidyne’s suggestion this step is not performed by the device itself is an attempt to improperly bring additional prior art into consideration.

Avidyne has repeatedly conceded that the attitude determining device is used in performing the sensing. *See* Avidyne brief, page 10 (“importing this [sensing] definition into the claim, *the sensing step of claims 1 and 16 requires* that the ADD automatically *detect its own* inertial orientation in relation to the earth frame coordinate system when the craft is not moving”) (emphasis added); *Id.* at page 12 (“[t]he measuring step actually describes an ordinary function of any ADD, namely, that the *device measure its own* attitude” and “the ADD’s attitude measurement (*measurement of its own* attitude)...”) (emphasis added.) Furthermore, the preambles of both claim 1 and 16 specify that the method obtains “attitude information of said craft *from said device.*” Since Avidyne has already admitted, in its Opening Brief at page 10, that L3’s interpretation of this term is correct, any argument here to the contrary must be unavailing.

VII. “Measuring” Does Not Require First Arriving At A “Pre-compensated” Attitude.

L3 interpretation: The claim requirement of “measuring an attitude of said mobile craft with said attitude determining device” is interpreted as “using the attitude determining device to measure an angular orientation of the mobile craft.”

Avidyne interpretation: “Processing the output of the sensors of the attitude determining device to determine a pre-compensated attitude of the mobile craft.”

Avidyne contends that “measuring” is restricted to “processing” the “output of the sensors” of the device to determine a “pre-compensated” attitude. This argument, in combination with its arguments on compensating, is the crux of Avidyne’s campaign to restrict the claims to a specific sequence: Avidyne attempts to limit the claims to a two-step operation in which “processing” is first performed until it is concluded with a “pre-compensated” attitude value, followed by a second separate processing step that performs compensating on that “pre-compensated” value. The claims do not, however, include (1) the structural limitation of “sensors” or their “output,” (2) a processor (in claim 1), or (3) computational activity undertaken to arrive at a “pre-compensated” attitude.

As Avidyne admits, the “output” of the disclosed embodiments’ sensors does not constitute an “attitude.” Rather, processing of the sensor output is necessary in order to arrive at an attitude. (“*Processing the output of the sensors...to determine a...attitude....*”) Accordingly, the output of the rate sensors 56 (in the moving craft embodiment (DX 1, Col 4: 50 – 54) is not an “attitude” because an “attitude” can only be arrived at upon processing of the rate sensor output. However, the processing of the rate sensor output in that embodiment would arrive at an attitude that is *already* compensated -- not a “pre-compensated” attitude -- because the measuring of an “attitude” would occur at least simultaneously with the “compensating.”

In any event, the claims do not require the measuring step to first arrive at a “pre-compensated” attitude of the craft as Avidyne erroneously suggests. Even if the ‘018 patent specification disclosed but a single embodiment employing the sequence argued by Avidyne, it would not be a basis for restricting the claims. For example, method claims in *Altiris Inc. v. Symantec Corp.*, 318 F.3d 1363 (Fed. Cir. 2003) were held not to be limited to the single sequence of steps disclosed in the specification:

Looking next to the written description, it clearly only discusses a single “preferred” embodiment in which the “setting” step occurs after the “testing” step and before the “booting normally” step. Nowhere, however, is there any statement that this order is important, any disclaimer of any other order of steps, or any prosecution history indicating a surrender of any other order of steps.

Altiris Inc., 318 F.3d at 1371. Likewise, the ‘018 claims are not limited.

As discussed in L3’s initial brief at pages 11 – 12 and 24, neither independent claim 1 nor claim 16 specify a “sensor.” Claim 1 does not reference a “processor” or “processing.”

Although claims 1 and 16 are broad enough to encompass these requirements, they are not so limited.

VIII. “Compensating” Is Not Limited To Performance In A Particular Order.

L3 interpretation: The claim requirement of “compensating said craft attitude measurement of said device with said static orientation measurement to obtain attitude information of said craft’s reference coordinate system with respect to said earth frame coordinate system” is interpreted as “using the static orientation measurement to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain the orientation of the craft relative to the earth.”

Avidyne interpretation: “Applying said static orientation measurement (determined in said sensing step) to the pre-compensated attitude of the craft (determined in said measuring step) to mathematically correct the pre-compensated attitude of the craft (determined in said measuring step) by adjusting for the difference between that pre-compensated measured attitude of the craft and the craft’s actual attitude relative to the earth frame.”

Avidyne suggests that each of the previously recited claim operations, “installing,” “sensing” and “measuring,” must be completed prior to the “compensating” operation. This is the culmination of Avidyne’s efforts to (1) break the attitude determining device into internal subcomponents incorporated from the described embodiments, (2) mandate that each recited step of the claim be performed to conclusion prior to the next step, and (3) restrict performance of each step to the sequence it appears in the claim. Avidyne’s approach ignores the tenets of claim interpretation, and again imports additional limitations into the claims. Furthermore, Avidyne

relies on a handful of district court cases which are distinguishable on the facts and/or pre-date the precedent of the Court of Appeals for the Federal Circuit.

A. The Term “Said” Neither Denotes nor Requires Sequencing

Avidyne mischaracterizes patent drafting conventions in its argument that the use of the term “said” in the claims mandates a particular sequence or order to performance of the claim steps. In this context, the word “said” is a commonplace shorthand reference, used to indicate that a particular claim requirement was previously referenced in the claim without restating the claim requirement. This is only a matter of shorthand reference to an antecedent basis in the claim, and says nothing about the specific sequence of performance of steps. See *Manual of Patent Examining Procedure* (“MPEP”), Chapter 2173.05(e) (DX 11). As stated in the patent drafting treatise, 2 *Patent Practice*, page 10 – 18 (5th Ed. 1993) (DX 12):

c. Antecedent Basis

Whenever an element or a part of an element is referred to a second time in a claim, it is preceded by the definite article “the” or more formalistically, by the term “said”. Stated another way, whenever an element or part of an element is recited in a claim utilizing either “the element” or “said element”, it is necessary that there exists *antecedent basis* for that element in the claim, i.e., the element must have already been introduced in the claim. The word “said” is used by many practitioners rather than “the” to refer back to previously recited elements or parts of elements in order to be more specific. Although somewhat legalistic, this practice is entirely correct and may serve as an aid in drafting claims, since the word “said” so pointedly reminds the practitioner that the element referred to must have been introduced somewhere earlier in the claim.

See also Faber, *Landis on Mechanics of Patent Claim Drafting*, § 23, pp. 50, 53 (3rd Ed. 1990)

(DX 13.) Under the applicable conventions, Avidyne’s argument would create a sequential limitation in nearly every patent claim ever written.

Courts have consistently determined that claims utilizing the terminology “said” in method steps do not establish a sequence for the practice of the steps. For example, in the *Altiris*

Inc. case, the Court of Appeals rejected the argument that a method claim was limited to a particular sequence of performing the claimed steps:

A method for gaining control of a computer prior to the normal boot sequence operating on a digital computer system, ...the method comprising:

testing automatically for automation boot sequence data, *said test including reading a boot selection flag* and comparing *said boot selection flag* with a known flag setting;

setting *said boot selection flag*; and

booting normally, if said testing automatically step indicates a normal boot sequence.

Altiris Inc., 318 F.3d at 1367 (emphasis added). In *Altiris*, the district court had found that the “setting” step had to be performed before the “booting normally” step. It was argued that the preamble language of gaining control “prior to the normal boot sequence” mandated that result. The Court of Appeals reversed, however, finding the claim was not limited to this sequence of steps, notwithstanding the fact that the only disclosed embodiment employed the particular sequence then being argued:

In the case before us, nothing in the intrinsic evidence indicates that the “setting” step must be performed before the “booting normally” step. Beginning with the claim language, it neither grammatically nor logically indicates that the “setting” step must occur in a particular order compared to the other steps. The only order mandated by the claim language is the conditional language in several of the steps, indicating that they must be performed after the “testing” step.

Looking next to the written description, it clearly only discusses a single “preferred” embodiment in which the “setting” step occurs after the “testing” step and before the “booting normally” step. Nowhere, however, is there any statement that this order is important, any disclaimer of any other order of steps, or any prosecution history indicating a surrender of any other order of steps.

Altiris, Inc., 318 F.3d at 1370-71. Under Avidyne’s argument, the step of setting “said” boot selection flag would be required for the testing automatically step, which in turn occurs prior to the booting normally step, thus mandating that the “setting *said* boot selection flag” occur prior

to booting normally. The Court of Appeals, however, ruled “nothing in the intrinsic evidence indicates the ‘setting’ step must be performed before the ‘booting normally step.’” Avidyne’s interpretation and legal basis is wrong.

Similarly, in *Moba, BV v. Diamond Automation, Inc.*, 325 F.3d 1306, 1310 (Fed. Cir. 2003), the subject method claim 24 included the following requirements:

guiding said eggs from said weighing stations *first to a plurality of egg holding stations* located downstream of said guide means and then to a plurality of locations longitudinally spaced-apart from and substantially horizontally co-planar with said holding stations,

guiding further eggs to *said plurality of holding stations...*

Moba, BV, 325 F.3d at 1310 (emphasis added). Based upon Avidyne’s argument the appearance of “said” in the step of “guiding further eggs to *said* plurality of holding stations” would mandate this second guiding step be performed after the first guiding step, yet the Court of Appeals ruled these steps could occur simultaneously. Notwithstanding the presence of “said” in the claims, the Court of Appeals determined:

Nowhere does the plain language of claim 24 require separate and consecutive performance of the various guidance steps. Rather, such a construction is contrary to the teaching the ‘505 patent. For example, the specification explicitly describes simultaneous performance of guiding steps two and three. [citation omitted] Moreover, simultaneous performance of the guiding steps is consistent with operating at a significant rate of speed, a stated object of the invention. [citation omitted] The prosecution history is also consistent with this claim construction. Hence, this court, like the district court as well, construes the guiding steps to include simultaneous performance.

Moba, BV, 325 F.3d at 1314.⁵

⁵ See also *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342-43 (Fed. Cir. 2001) (rejecting argument that steps were limited to sequence: “there is no reason why the claim needs to be construed to require that the steps be performed in the order written”); *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 102 F.Supp.2d 199, 204, 218 (D. Del. 2000) (rejecting significance of order of method steps); *Promega Corp. v. Novagen, Inc.*, 6 F.Supp.2d 1004, 1010, 1021 (W.D. Wis. 1997) (method steps using “said” not limited to sequence).

Other widely used claim drafting conventions that would seemingly identify a particular sequence are similarly recognized as mere references, providing expediency in drafting claims rather than establishing a sequence or order. For example, the use of “first” and “second” to refer to two different parts or steps does not establish a sequence to their performance. *See, e.g., Gillette Co. v. Energizer Holdings Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005) (use of “first” and “second” is common patent-law convention to distinguish between repeated instances of an element and should not necessarily be interpreted to impose a serial limitation on a claim); *3M Innovative Properties Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003) (use of “first” and “second” is a common patent-law convention to distinguish between repeated instances of an element or limitation and should not itself impose a serial or temporal limitation onto a claim).

Avidyne does not, and cannot, refute the above authority, which supports L3’s claim interpretations. Instead, Avidyne relies on cases from other districts which predate – and are therefore negated by -- those controlling decisions. Furthermore, the cases cited by Avidyne do not support its arguments. In the case of *Thorn EMI North America, Inc. v. Intel Corporation*, 928 F. Supp 449, 459-60 (D. Del. 1996), the district court found that the method claims were restricted to a particular sequence of two steps for a number of reasons, including that the steps were linked by the sequence limiting term “then” (step a, then, step b), the sequence limitation of “then” was added by amendment during prosecution to distinguish the prior art, and the inventor argued during prosecution that it was the sequence of the steps that distinguished the prior art.

Again, in the case of *Loral Fairchild Corp. v. Victor Company of Japan, Ltd.*, 906 F.Supp 798, 804-06 (E.D.N.Y. 1995), the court found that two steps were restricted to a sequence where during prosecution the inventor amended the claims and argued the sequence of the steps in

order to distinguish over the prior art and thus obtain allowance of the claims. The portion of this case relied upon by Avidyne was the court's view that "[p]redominant language norms suggest recounting process steps in a chronological sequence." Such view, however, was not the sole – or even the major – reason that the sequencing was applied and, in any even, this analysis is no longer good law. (*See supra* at pages 10 - 12.)

Finally, Avidyne references an earlier case from the Court of Appeals for the Federal Circuit that is readily distinguishable on the facts and likewise not on point. In *Mantech Environmental Corp. v. Hudson Environmental Services, Inc.*, 152 F.3d 1368, 1375-76 (Fed. Cir. 1998), the relevant chemical process for treating groundwater expressly required a sequence. In step (a) wells were provided, and in step (b) acid was provided into the water to establish acidic conditions. In step (c) something was added to "said acidified groundwater." This required the acid step (b) to have been previously performed, not due to the presence of "said" in step (c), but because the water was stated to already have been "acidified." Step (d) required a chemical reaction "in the presence of" two ingredients, which by chemical terms requires the ingredients to have been added.

B. Again, Restrictions may not be Imported Into the Claims

Again, Avidyne resorts to the specification to import a restriction that is not present in the claims, and then proceeds to break the imported Abstract into pieces in order to impress a sequence on that paragraph. The Abstract in question states:

Thereafter, an attitude of the mobile craft with respect to the earth frame is measured with the attitude determining device and such measurement is compensated with the static orientation measurement to obtain attitude information of the craft's reference coordinate system with respect to the earth frame coordinate system.

(DX 1, cover.) This language is consistent with the prosecution history, where the inventors

treated measuring and compensating as a single step in their communications with the Patent Office (DX 4, page 3). Consistent with the claims, the Abstract does not refer to the “measuring” as itself “obtaining” or operating “to obtain” anything. Moreover, the Abstract’s purpose is to enable the Patent Office and the public to “determine quickly from a cursory inspection the nature and gist of the technical disclosure.” 37 CFR §1.72.⁶

Avidyne also cites to the Summary (Avidyne’s brief, page 16), but the quoted paragraph does not use the term “Thereafter” or any other sequence terms such as “first this, followed by that.” Avidyne also suggests that the court “note” a sentence from the Description of the Preferred Embodiment that discusses storing information to be accessed subsequently. Not only is it improper to limit the claims to the disclosed embodiments, but claim 1 does not even include “storing.” Avidyne’s arguments should be rejected.

IX. “Storing” Is Not Limited to “Persistently” Retaining in Memory.

L3 interpretation: The claim requirement of “storing said static orientation measurement in a memory” is interpreted as “retaining static orientation measurement data within the attitude determining device.”

Avidyne interpretation: “Persistently retaining the static orientation measurement in a memory.”

Avidyne suggests claim 16’s requirement of “storing” means “persistently” retaining that information in a memory. There is absolutely no support for this interpretation: Avidyne cites to nothing in embodiments or dictionaries for its urged interpretation, which appears to have been fabricated by Avidyne. Avidyne seeks to add yet another restriction to the claims that is simply not there.

⁶ At the time the ‘018 patent was filed and prosecuted, Patent and Trademark Office regulations provided “The abstract shall not be used for interpreting the scope of the claims.” 37 CFR § 1.72 (1995 and 1998 versions) (DX 14). Although it has been subsequently ruled that an abstract can be considered during claim interpretation, at the time the ‘018 patent was prosecuted the inventors would have no reason to believe that statements in the Abstract could be considered to impact claim interpretation.

Avidyne further argues that claim 16 makes clear the static orientation measurement must be retained in memory in the same form as the initial measurement. (Avidyne brief, page 15.) There is no such requirement. Nothing in the text of claim 1, the specification, or prosecution history would require retention in the same way as this was calculated.⁷

X. The “Retrieving” Step Is Not Limited to a Single Processor

L3 interpretation: The claim requirement of “retrieving said static orientation measurement from said memory to a processor of said device” is interpreted as “providing static orientation measurement data to an electronic computational device within the attitude determining device.”

Avidyne interpretation: “Obtaining the previously stored static orientation measurement and feeding it to the processor of the attitude determining device.”

Avidyne attempts to inferentially restrict “a processor” to a single processor, in arguing information is fed to “the” processor. If a claim includes the transition word “comprising,” subsequent clauses with the indefinite article “a” mean “one or more.” *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000); *See, Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1371 (Fed. Cir. 2005) (the claim language “comprising a group of first, second and third blades” covers three or more blades and thus “four” blades). An attitude determining device may include multiple processors and still meet the requirements of claim 16. Claim 16 is not restricted to all of the operations taking place in a single processor. Further, if left uninterpreted, the word “processor” would leave open the potential for juror confusion.

⁷ Again, Avidyne argues that the use of the word “said” mandates the measurement be stored in the same way it is calculated. As previously discussed at Section VIII *supra*, this argument is incorrect.

XI. The “Compensating” Requirement of Claim 16 Is Not Limited To A Particular Order Of Performing The Claimed Operations.

L3 interpretation: The claim requirement of “compensating said craft attitude measurement with said retrieved static orientation measurement in said processor to obtain attitude information of said craft’s reference coordinate system with respect to said earth frame coordinate system” is interpreted as “using the static orientation measurement data in an electronic computational device to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain an orientation of the craft relative to the earth.”

Avidyne interpretation: “Applying said retrieved static orientation measurement (determined in said sensing step) to the pre-compensated attitude of the craft (determined in said measuring step) in said processor to mathematically correct the pre-compensated attitude of the craft (determined in said measuring step) by adjusting for the difference between that pre-compensated measured attitude of the craft and the craft’s actual attitude relative to earth.”

In its interpretation of this clause Avidyne does not raise any new issues beyond those addressed herein at Section VII, and, for the same reasons as discussed there, Avidyne’s interpretation is not correct.

XII. Conclusion.

Specific embodiments are not to be incorporated into the claim interpretations and the claimed method should not be restricted to a particular sequence or order of operation. The intrinsic evidence, and in particular the claims themselves, do not provide for these limitations. Avidyne’s suggested interpretations should be rejected.

Respectfully submitted,

L-3 COMMUNICATIONS AVIONICS
SYSTEMS, INC.

Dated: October 16, 2006

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DEFENDANT'S

EXHIBIT 10

EXHIBIT DX 10: PROPOSED CLAIM CONSTRUCTION CHART

Claim language	L-3 Avionic's Construction	Avidyne's Pre-brief Construction	Avidyne's as Briefed Construction
(Claim 1 and 16): Attitude determining device	A piece of equipment that determines angular orientation relative to the earth frame and is used to establish the attitude of a craft.	A device that includes gravity and motion sensors and a processor for processing the output of the sensors to determine attitude.	A device that includes sensors and a processor for processing the output of the sensors to determine attitude.
(Claim 1 and 16): Compensating for installation orientation of an attitude determining device	Adjusting to neutralize the effect of the orientation of an attitude determining device as installed.	No Definition.	No Definition.
(Claim 1 and 16): Sensing the installation orientation of said attitude determining device with respect to said earth frame	Detecting an angular orientation with the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of said device.	Detecting the angular position of the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of said device.	Automatically determining the angular position of the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of the device.
(Claim 1 and 16): Measuring an attitude of said mobile craft with said attitude determining device	Using the attitude determining device to measure an angular orientation of the mobile craft.	Using the processor of the attitude determining device to process the output of the sensors of the attitude determining device to obtain the uncompensated attitude of the mobile craft.	Processing the output of the sensors of the attitude determining device to determine a pre-compensated attitude of the mobile craft.
(Claim 1): Compensating said craft attitude measurement of said device with said static orientation measurement to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system	Using the static orientation measurement to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain an orientation of the craft relative to the earth.	Applying the said static orientation measurement determined in said sensing step to the uncompensated attitude of the craft determined in said measuring step to mathematically modify the uncompensated attitude of the craft determined in said measuring step to thereby adjust for a difference between that measured attitude of the craft and the craft's actual attitude relative to the earth.	Applying said static orientation measurement (determined in said sensing step) to the pre-compensated attitude of the craft (determined in said measuring step) to mathematically correct the pre-compensated attitude of the craft (determined in said measuring step) by adjusting for the difference between that pre-compensated measured attitude of the craft and the craft's actual attitude relative to the earth frame.

EXHIBIT DX 10: PROPOSED CLAIM CONSTRUCTION CHART CONT.

Claim language	L-3 Avionic's Construction	Avidyne's Pre-brief Construction	Avidyne's as Briefed Construction
(Claim 16): Storing said static orientation measurement in a memory	Retaining static orientation measurement data within the attitude determining device.	Persistently retaining the static orientation measurement in a memory.	Persistently retaining the static orientation measurement in a memory.
(Claim 16): Retrieving said static orientation measurement from said memory to a processor of said device.	Providing static orientation measurement data to an electronic computational device within the attitude determining device.	Obtaining the previously stored static orientation measurement and feeding it to the processor of the attitude determining device.	Obtaining the previously stored static orientation measurement and feeding it to the processor of the attitude determining device.
(Claim 16): Compensating said craft attitude measurement with said retrieved static orientation measurement in said processor to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system.	Using the static orientation measurement data in an electronic computational device to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain an orientation of the craft relative to the earth.	Applying the retrieved said static orientation measurement determined in said sensing step to the uncompensated attitude of the craft determined in said processor to mathematically modify the uncompensated attitude of the craft determined in said measuring step to thereby adjust for a difference between that measured attitude of the craft and the craft's actual attitude relative to the earth.	Applying said retrieved static orientation measurement (determined in said sensing step) to the pre-compensated attitude of the craft (determined in said measuring step) in said processor to mathematically correct the pre-compensated attitude of the craft (determined in said measuring step) by adjusting for the difference between that pre-compensated measured attitude of the craft and the craft's actual attitude relative to earth.

DEFENDANT'S

EXHIBIT 11

Manual of PATENT EXAMINING PROCEDURE

Original Eighth Edition, August 2001
Latest Revision August 2005



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Additions to the text of the Manual are indicated by arrows (>) inserted in the text. Deletions are indicated by a single asterisk (*) where a single word was deleted and by two asterisks (**) where more than one word was deleted. The use of three or five asterisks in the body of the laws, rules, treaties, and administrative instructions indicates a portion of the law, rule, treaty, or administrative instruction which was not reproduced.

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Seventh Edition, July 1998
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Revision 1, February 2003
Revision 2, May 2004
Revision 3, August 2005

2173.05(e)

MANUAL OF PATENT EXAMINING PROCEDURE

(A) "R is halogen, for example, chlorine";

(B) "material such as rock wool or asbestos" *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1949);

(C) "lighter hydrocarbons, such, for example, as the vapors or gas produced" *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949); and

(D) "normal operating conditions such as while in the container of a proportioner" *Ex parte Steigerwald*, 131 USPQ 74 (Bd. App. 1961).

>The above examples of claim language which have been held to be indefinite are fact specific and should not be applied as *per se* rules. See MPEP § 2173.02 for guidance regarding when it is appropriate to make a rejection under 35 U.S.C. 112, second paragraph.<

2173.05(e) Lack of Antecedent Basis [R-1]

A claim is indefinite when it contains words or phrases whose meaning is unclear. The lack of clarity could arise where a claim refers to "said lever" or "the lever," where the claim contains no earlier recitation or limitation of a lever and where it would be unclear as to what element the limitation was making reference. Similarly, if two different levers are recited earlier in the claim, the recitation of "said lever" in the same or subsequent claim would be unclear where it is uncertain which of the two levers was intended. A claim which refers to "said aluminum lever," but recites only "a lever" earlier in the claim, is indefinite because it is uncertain as to the lever to which reference is made. Obviously, however, the failure to provide explicit antecedent basis for terms does not always render a claim indefinite. If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite. *Ex parte Porter*, 25 USPQ2d 1144, 1145 (Bd. Pat. App. & Inter. 1992) ("controlled stream of fluid" provided reasonable antecedent basis for "the controlled fluid"). Inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation "the outer surface of said sphere" would not require an antecedent recitation that the sphere has an outer surface. >See *Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1359, 61 USPQ2d 1216, 1218-19 (Fed. Cir. 2001) (holding that recitation of "an ellipse" provided antecedent basis for "an ellipse having a major diameter" because "[t]here

can be no dispute that mathematically an inherent characteristic of an ellipse is a major diameter").<

EXAMINER SHOULD SUGGEST CORRECTIONS TO ANTECEDENT PROBLEMS

Antecedent problems in the claims are typically drafting oversights that are easily corrected once they are brought to the attention of applicant. The examiner's task of making sure the claim language complies with the requirements of the statute should be carried out in a positive and constructive way, so that minor problems can be identified and easily corrected, and so that the major effort is expended on more substantive issues. However, even though indefiniteness in claim language is of semantic origin, it is not rendered unobjectionable simply because it could have been corrected. *In re Hammack*, 427 F.2d 1384 n.5, 166 USPQ 209 n.5 (CCPA 1970).

A CLAIM TERM WHICH HAS NO ANTECEDENT BASIS IN THE DISCLOSURE IS NOT NECESSARILY INDEFINITE

The mere fact that a term or phrase used in the claim has no antecedent basis in the specification disclosure does not mean, necessarily, that the term or phrase is indefinite. There is no requirement that the words in the claim must match those used in the specification disclosure. Applicants are given a great deal of latitude in how they choose to define their invention so long as the terms and phrases used define the invention with a reasonable degree of clarity and precision.

A CLAIM IS NOT *PER SE* INDEFINITE IF THE BODY OF THE CLAIM RECITES ADDITIONAL ELEMENTS WHICH DO NOT APPEAR IN THE PREAMBLE

The mere fact that the body of a claim recites additional elements which do not appear in the claim's preamble does not render the claim indefinite under 35 U.S.C. 112, second paragraph. See *In re Larsen*, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) (The preamble of the *Larsen* claim recited only a hanger and a loop but the body of the claim positively recited a linear member. The examiner rejected the claim under 35 U.S.C. 112, second paragraph, because the omission from the claim's preamble of a critical element (i.e., a linear member) renders that

claim indefinite. The court reversed the examiner's rejection and stated that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor's contribution to the art. Upon review of the claim in its entirety, the court concluded that the claim at issue apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, paragraph 2.).

2173.05(f) Reference to Limitations in Another Claim

A claim which makes reference to a preceding claim to define a limitation is an acceptable claim construction which should not necessarily be rejected as improper or confusing under 35 U.S.C. 112, second paragraph. For example, claims which read: "The product produced by the method of claim 1." or "A method of producing ethanol comprising contacting amylose with the culture of claim 1 under the following conditions" are not indefinite under 35 U.S.C. 112, second paragraph, merely because of the reference to another claim. See also *Ex parte Porter*, 25 USPQ2d 1144 (Bd. Pat. App. & Inter. 1992) where reference to "the nozzle of claim 7" in a method claim was held to comply with 35 U.S.C. 112, second paragraph. However, where the format of making reference to limitations recited in another claim results in confusion, then a rejection would be proper under 35 U.S.C. 112, second paragraph.

2173.05(g) Functional Limitations [R-3]

A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step. >In *Innova/Pure*

Water Inc. v. Safari Water Filtration Sys. Inc., 381 F.3d 1111, 1117-20, 72 USPQ2d 1001, 1006-08 (Fed. Cir. 2004), the court noted that the claim term "operatively connected" is "a general descriptive claim term frequently used in patent drafting to reflect a functional relationship between claimed components," that is, the term "means the claimed components must be connected in a way to perform a designated function." "In the absence of modifiers, general descriptive terms are typically construed as having their full meaning." *Id.* at 1118, 72 USPQ2d at 1006. In the patent claim at issue, "subject to any clear and unmistakable disavowal of claim scope, the term 'operatively connected' takes the full breath of its ordinary meaning, i.e., 'said tube [is] operatively connected to said cap' when the tube and cap are arranged in a manner capable of performing the function of filtering." *Id.* at 1120, 72 USPQ2d at 1008.<

Whether or not the functional limitation complies with 35 U.S.C. 112, second paragraph, is a different issue from whether the limitation is properly supported under 35 U.S.C. 112, first paragraph, or is distinguished over the prior art. A few examples are set forth below to illustrate situations where the issue of whether a functional limitation complies with 35 U.S.C. 112, second paragraph, was considered.

It was held that the limitation used to define a radical on a chemical compound as "incapable of forming a dye with said oxidizing developing agent" although functional, was perfectly acceptable because it set definite boundaries on the patent protection sought. *In re Barr*, 444 F.2d 588, 170 USPQ 33 (CCPA 1971).

In a claim that was directed to a kit of component parts capable of being assembled, the Court held that limitations such as "members adapted to be positioned" and "portions . . . being resiliently dilatable whereby said housing may be slidably positioned" serve to precisely define present structural attributes of interrelated component parts of the claimed assembly. *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976).

2173.05(h) Alternative Limitations

I. MARKUSH GROUPS

Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One

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EXHIBIT 12

PATENT PRACTICE

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c. Antecedent Basis

Whenever an element or a part of an element is referred to a second time in a claim, it is preceded by the definite article "the" or more formalistically, by the term "said". Stated another way, whenever an element or part of an element is recited in a claim utilizing either "the element" or "said element", it is necessary that there exists *antecedent basis* for that element in the claim, i.e., the element must have already been introduced in the claim. The word "said" is used by many practitioners rather than "the" to refer back to previously recited elements or parts of elements in order to be more specific. Albeit somewhat legalistic, this practice is entirely correct and may serve as an aid in drafting claims, since the word "said" so pointedly reminds the practitioner that the element referred to must have been introduced somewhere earlier in the claim. If the term "said" is employed, it should be employed consistently; it is also permissible to use "said" any time that reference is made back to an *element* of the invention and to use "the" to refer back to *parts* of elements or the like, as long as consistency is employed. The expression "the said" should be avoided as an awkward redundancy.

Introduction into the *preamble* of a part associated with the claimed combination, or often a workpiece or the like upon which the invention acts, also provides a suitable antecedent basis for referring in the *claim body* again to the same item utilizing the definite article "the" or "said". For example:

A device for cracking a nut, comprising:

- (a) a concave member for holding the nut;
- (b) etc.

The nut is not an element of the device, but because it has been properly introduced in the preamble, it can properly be referred to as "the nut" in the body of the claim.

d. Naming the Element

Of course, the first task of the draftsman is to decide which elements are to be introduced into the body of a claim. It is important

Where several elements of the same type are introduced at different places in a claim, it is very helpful to use designations like "a first leg", "a second leg". This is done where the drafter must distinguish at some point in the claim between the several similar elements, for example, to modify one in some way and the other in another way. This drafting tool is particularly useful if it is not important which of the several elements is to be modified, because the resulting claim will be broad enough to cover the possibility that any one of the plural elements is modified.

Where an upper limit on the number of elements is involved, it is proper to recite "no more than ten elements A" or simply "fewer than 11 elements A". Similarly, where a particular range having a lower and upper limit is involved, it is conventional to recite "having between 2 and 10 elements A". Other variations are also possible, such as "having at least 2 elements A but fewer than 11". Such ranges are often utilized in connection with claims to processes and compositions of matter in order to set forth characterizing features such as proportions of ingredients, times, temperatures, concentrations, molecular weights, particle sizes, or physical and chemical properties.

g. Order of Elements

The elements of an invention should be set forth in some logical order within a claim. Often there are several orders which make sense, and normally any of them could be employed. An order that is difficult to understand or has no logical basis is not necessarily "wrong", but it should be avoided, as it could be considered to render the claim indefinite.

One common approach to choosing an order for the elements in a claim may be termed a "functional" approach. In this method, the elements are set forth in the order with which they come into contact with a workpiece, or in other words the order follows the function of the device or machine. Another approach is "structural" in nature. The claim drafter begins with a base or a frame or some other fundamental element of the combination and builds up from it. Simply stated, the claim is drafted in the same order as one would assemble the parts of the claimed invention. This approach facilitates the common claim drafting requirement of having to interrelate each

newly recited element to an already recited element. This structural order is normally relatively easy to follow and is therefore commonly employed.

The order of process steps is often determined inflexibly by a necessary sequence, e.g., in chemical processes, whereas the order of reciting components in a composition of matter is usually irrelevant. In process claims, the mere recitation or listing of the steps in a particular order does not normally imply that the steps must be carried out in that order for them to fall within the claim. For example, in many types of processes, all steps are taking place simultaneously. Therefore, if a particular order of steps is required by virtue of the technological nature of the invention or to distinguish over the prior art, it is necessary to introduce into the claim some statement of the chronological order of the recited steps, e.g., "first mixing", "then heating", "after said mixing step, heating".

h. Defining Elements in Terms of Function

i. Means-Plus-Function Clauses

The so-called "means clause" is a valuable tool, particularly in connection with claims to mechanical devices, and must be thoroughly understood.

The last paragraph of 35 USC §112 specifically provides for means clauses:

An element *in a claim for a combination* may be expressed as a *means* or *step for performing a specified function* without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof.

Pertinent portions of the statutory language have been emphasized. Thus, a means-plus-function clause may be utilized only in a claim for a combination. In other words, a claim to a single element wherein the element is recited as a means-plus-function is not a proper claim.

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EXHIBIT 13

Landis on Mechanics of Patent Claim Drafting

Third Edition

Robert C. Faber

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New York City

DX 13

sider the practice unsafe. For example, when the claim is being interpreted for equivalents by a court, the court may still limit the scope of claim breadth due to the presence of numbers referring to drawings of an embodiment, despite the Manual's recommending (for examiners but not for judges) that the reference characters have no effect.

Summary

Do not use reference characters from the drawings in claims, but it is not wrong to do (if placed in parentheses).

§ 23 Antecedents; Indefiniteness

The first time an element or part is mentioned, it should not be preceded by a definite article ("the") or by "said." Instead the indefinite article ("a" or "an") should be used, as in claim 1: "*a* container," "*a* base," etc. This practice merely follows normal rules of grammar. Plural elements are not preceded by articles, as there is no plural indefinite article. Thus "containers." Sometimes an element is preceded by a numerical adjective when it is introduced in a claim, as "two containers." A "means for" clause requires no article: "means for oscillating. . . ." Note that none of these uses a definite article. When each previously identified element or part is referred to again, the definite article should be used, as "*the* container," "*the* base," or "*the* oscillating means" in claim 1; or "*the* two containers," or simply "*the* two containers."

The word "said" is used by many practitioners rather than "the" to refer back to previously recited elements, sometimes to a previously recited anything. This practice is unobjectionable, although perhaps overly legalistic. If "sais" or "thes" are used, one should be consistent in the usage and not alternate between those words in repetitions of the same element or among different elements. One common style is to use "said" only for the elements themselves, and "the" for every-

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APPARATUS OR MACHINE CLAIMS

§ 23

thing else. The expression "the said" one sometimes sees is a patent redundancy and should be avoided.

When referring back to an element, it must be perfectly clear which element. The claim must be consistent within itself. For example, if two gears have been described in the claim, it is improper to refer back to "said gear"; refer to "said first gear," "said drive gear," etc. Similarly, if a motor has been recited, do not refer back to "said drive means." In another example, the claim recited "a handle" and then something connected to "a handle"; thus it was not clear whether the first handle was meant or a different one. Such descriptions are "indefinite." It is also improper to describe additional details of an element when referring back; for example, if "a gear" has been recited, it would be improper to refer to "said *plastic* gear." This is also called an "indirect limitation" in MPEP 706.03(d). To introduce the "plastic" nature of the gear, use a describing clause, "the gear is plastic" or "the gear is comprised of plastic."

Claim limitations are often of such length that an attempt to refer back to an earlier mentioned element may introduce an ambiguity, "a handle connected to the gear, which is supported on the axis to pivot about it." To what does "which" and "it" refer, the handle, the gear, or the axis? Better would be "a handle connected to the gear, the handle is supported on the axis to pivot about the gear"—no ambiguity there. Do not hesitate to repeat the name of an element each time it appears in a clause (the handle). Avoid using indefinite words to refer back (which or that) or pronouns that do not mention the name of the element (it) unless there can be no doubt which element is being indicated. Wherever there is a second element between a first mentioned element and a later word referring back, as occurred in the above handle/gear/axis, example, use of an indefinite reference back should be avoided, as ambiguity is virtually unavoidable.

In dependent claims also, one must be careful to avoid confusion between elements in any parent claims (or claims) and elements added by the dependent claim.

All such rejections or objections on matters of claim form are based

§ 23

PATENT CLAIM DRAFTING

upon claim "indefiniteness" of the claim and trace from 35 U.S.C. section 112, i.e., the subject matter has not been "particularly pointed out and distinctly claimed," meaning that the examiner cannot tell what the claim covers.¹³ In *In re Miller*,¹⁴ the court held that an "indefiniteness" rejection must be based on section 112,¹⁵ and held that the Patent and Trademark Office could not reject the claim under section 103 (obviousness) by ignoring the allegedly indefinite words.¹⁶ The *Miller* court said: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

This question arises in many contexts, such as preamble limitations (section 56), mental steps (section 44), functional language (section 31), printed matter (section 65) and others.

Ex parte Schaefer,¹⁷ holds that:

Omission of some elements of the device [the complete device described in the specification, through the use of the preamble "comprising" — Section 7] makes the claim broad, but not vague, indefinite or misdescriptive.

In other words, the court and Board are saying to the examiner: "reject broad claims on prior art, if you can find any, but not under section 112 as 'indefinite,' etc. Section 112 applies only where you cannot understand what the claim covers." See also "incomplete" claims, section 66.

Comparative words are also indefinite, unless those words have been clearly defined in the disclosure or specification. Usually, those words can mean virtually anything. If a distance is "predetermined" or a quantity is "sufficient," how much or how great are these amounts. It is best not to use such terms at all in the claims. In *Norton Co. v.*

13. See MPEP 706.03(d); *In re Venezia*, 189 U.S.P.Q. (BNA) 149, 151 (C.C.P.A. 1976).

14. 169 U.S.P.Q. (BNA) 597, 600 (C.C.P.A. 1971).

15. MPEP 706.02.

16. Citing *In re Wilson*, 165 U.S.P.Q. (BNA) 494 (C.C.P.A. 1970).

17. 171 U.S.P.Q. (BNA) 110 (Bd. App. 1970).

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APPARATUS OR MACHINE CLAIMS

§ 24

Bendix Corp.,¹⁸ a claim was held invalid for indefiniteness for inclusion of the phrases "closely spaces" and "substantial distance." Apparently, these features or relationships were important to novelty, and the specification did not define them. The testimony showed that a potential infringer could not tell, nor could the patentee, just what infringed and what did not.

The cases on indefiniteness can be confusing and may turn on specific facts adduced at trial, long after the claim was written and patented.

Summary

Use "a" or "an" the first time you mention an element or part in a claim, where grammatical rules dictate. Use "the" or "said" after that, when referring again to the same element or part. Make sure the claim is consistent with itself, that each "the" or "said" element has one and only one clear antecedent in the claim, and that consistent, definite phraseology is used throughout the claim. In general, make sure the claim is definite and clearly understandable as to what it covers and how it reads on the detailed description and drawing.

§ 24 Alternative Expressions

It is ordinarily improper to use alternative expressions for an element or part in a claim. Thus, it is improper to state: "a spring or a weight for urging the carriage against the stop [assuming the carriage and stop had been defined]." In effect, that would be two claims. The way to avoid alternative expressions is to find or invent some expression that is generic to both embodiments or species, such as "means for biasing" in the above example. (See section 50 on Markush expressions for a limited exception in certain types of chemical cases.)

18. 171 U.S.P.Q. (BNA) 449 (2d Cir. 1971).

DEFENDANT'S

EXHIBIT 14

code of federal regulations

Patents, Trademarks, and Copyrights

37

Revised as of July 1, 1995

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

AS OF JULY 1, 1995

With Ancillaries

Published by
the Office of the Federal Register
National Archives and Records
Administration

as a Special Edition of
the Federal Register



CFR Ch. I (7-1-95 Edition)**Patent and Trademark Office, Commerce****§ 1.73**

may be made on information by an applicant other than the inventor.

elemental oath or declaration the requirements of § 1.63 are filed if the application after the oath or declaration or if the oath or declaration is signed:

review thereof by the person who signed the oath or declaration; or review of the specification of the claims, as required

35 U.S.C. 1.63-1.64

Jan. 20, 1983, as amended at 57 FR 20225, Apr. 25, 1992; 60 FR 20225, Apr. 25, 1995

Statement in lieu of oath.

Statement to be filed in the Patent and Trademark Office and which is required by law, rule, or other regulation under oath may be substituted for a written declaration. The statement may be used in lieu of an oath otherwise required, if, and only if, the declarant is on the same facts and circumstances that willful false statements are punishable by imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issued thereon. The declarant must believe that the statements made of the declarant are true and that the statements made on information believed to be true.

35 U.S.C. 1.63-1.64

Language oaths and declarations.

For an individual making a declaration cannot understand the oath or declaration in the language that such individual understands and shall state in the declaration the documents to which the declaration relates.

The text of any oath or declaration in a language other than English provided or approved by the Patent and Trademark Office, it accompanied by a verified translation, except that in the

case of an oath or declaration filed under § 1.63, the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

(35 U.S.C. 6, Pub. L. 97-247)

[42 FR 5594, Jan. 28, 1977, as amended at 48 FR 2711, Jan. 20, 1983]

§ 1.70 [Reserved]**SPECIFICATION**

AUTHORITY: Secs. 1.71 to 1.79 also issued under 35 U.S.C. 112.

§ 1.71 Detailed description and specification of the invention.

(a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

(b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth.

(c) In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices

in drawings, see § 1.84(s). The content of the notice must be limited to only those elements provided for by law. For example, "©1983 John Doe" (17 U.S.C. 401) and "M* John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

(e) The authorization shall read as follows:

A portion of the disclosure of this patent document contains material which is subject to (copyright or mask work) protection. The (copyright or mask work) owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all (copyright or mask work) rights whatsoever.

[24 FR 10332, Dec. 22, 1959, as amended at 53 FR 47808, Nov. 28, 1988; 58 FR 38723, July 20, 1993]

§ 1.72 Title and abstract.

(a) The title of the invention, which should be as short and specific as possible, should appear as a heading on the first page of the specification, if it does not otherwise appear at the beginning of the application.

(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably following the claims under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

(Pub. L. 94-131, 89 Stat. 685)

[31 FR 12922, Oct. 4, 1966, as amended at 43 FR 20464, May 11, 1978]

§ 1.73 Summary of the invention.

A brief summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede

code of federal regulations

Patents, Trademarks, and Copyrights

37

Revised as of July 1, 1998

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

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With Ancillaries

Published by
the Office of the Federal Register
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Administration

as a Special Edition of
the Federal Register



§ 1.69

§ 1.69 Foreign language oaths and declarations.

(a) Whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand and shall state that such individual understands the content of any documents to which the oath or declaration relates.

(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by an English translation together with a statement that the translation is accurate, except that in the case of an oath or declaration filed under §1.63, the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

(35 U.S.C. 6, Pub. L. 97-247)

[42 FR 5594, Jan. 28, 1977, as amended at 48 FR 2711, Jan. 20, 1983; 62 FR 53189, Oct. 10, 1997]

§ 1.70 [Reserved]

SPECIFICATION

AUTHORITY: Secs. 1.71 to 1.79 also issued under 35 U.S.C. 112.

§ 1.71 Detailed description and specification of the invention.

(a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

(b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by

37 CFR Ch. I (7-1-98 Edition)

the inventor of carrying out his invention must be set forth.

(c) In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices in drawings, see §1.84(s). The content of the notice must be limited to only those elements provided for by law. For example, “©1983 John Doe” (17 U.S.C. 401) and “*M* John Doe” (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

(e) The authorization shall read as follows:

A portion of the disclosure of this patent document contains material which is subject to (copyright or mask work) protection. The (copyright or mask work) owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all (copyright or mask work) rights whatsoever.

[24 FR 10332, Dec. 22, 1959, as amended at 53 FR 47808, Nov. 28, 1988; 58 FR 38723, July 20, 1993]

§ 1.72 Title and abstract.

(a) The title of the invention, which should be as short and specific as possible, should appear as a heading on the first page of the specification, if it does not otherwise appear at the beginning of the application.

(b) A brief abstract of the technical disclosure in the specification must

Patent and Trademark Of

commence on a separate page, preferably following the claim heading "Abstract of the Invention". The purpose of the abstract is to inform the public generally of the nature and gist of the invention as claimed, quickly from a cursory review of the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the invention.

(Pub. L. 94-131, 89 Stat. 685)

[31 FR 12922, Oct. 4, 1966, as amended; 39 FR 20464, May 11, 1978; 61 FR 428

§ 1.73 Summary of the ir

A brief summary of the invention indicating its nature and the manner in which it may be made, which may include a statement of the object or objects to be attained by the invention, the detailed description of the invention, and the claims should, when set forth, be commensurate with the scope of the invention claimed and any objects to be attained by the invention.

§ 1.74 Reference to draw

When there are drawings, there should be a brief description of the drawings and a description of the invention to the different views by numbers of the figures. Different parts by use of numbers or numerals (preferably

§ 1.75 Claim(s).

(a) The specification with a claim particular and distinctly claimin matter which the appli his invention or discove

(b) More than one class presented provided they tally from each other duly multiplied.

(c) One or more claim presented in dependent back to and further claim or claims in the claim or claims in the claim. Any dependent claim to more than one other multiple dependent claim, such other claims in only. A multiple dependent claim may not serve as a basis for a multiple dependent claim. A claim may not be used for purposes under § 101 as a multiple dependent claim will

of carrying out his invention set forth.

In the case of an improvement, the invention must particularly point out and distinctly claim the part or parts of the process, manufacture, or composition to which the improvement is made, and the description must be confined to the specific improvements and to such parts as necessarily relate thereto, and must be complete and clear in its understanding of it.

For light or mask work notice must be given in a design or utility application adjacent to copy-right work material contained in the notice. The notice may appear in any appropriate portion of the patent disclosure. For notices see § 1.84(s). The content of the notice must be limited to only that which is provided for by law. For 383 John Doe" (17 U.S.C. 109) "John Doe" (17 U.S.C. 909) properly limited and, under the terms, legally sufficient for right and mask work, recitation of a copyright or notice will be permitted in the authorization language set forth in paragraph (e) of this section is the beginning (preferably in the first paragraph) of the specification shall read as

the disclosure of this patent contains material which is subject to mask work protection. The mask work owner has no objection to the reproduction by any person of the document or the patent as it appears in the Patent and Trademark Office file or records, but reserves all (copyright or mask work) rights thereunder.

Sec. 22, 1959, as amended at 53 Stat. 1988; 58 FR 38723, July 20, 1993.

and abstract.

The abstract of the invention, which must be short and specific as possible, shall appear as a heading on the first page of the specification, if it does not appear at the beginning of the specification.

The abstract of the technical content of the specification must

commence on a separate sheet, preferably following the claims, under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

(Pub. L. 94-131, 89 Stat. 685)

[31 FR 12922, Oct. 4, 1966, as amended at 43 FR 20464, May 11, 1978; 61 FR 42803, Aug. 19, 1996]

§ 1.73 Summary of the invention.

A brief summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede the detailed description. Such summary should, when set forth, be commensurate with the invention as claimed and any object recited should be that of the invention as claimed.

§ 1.74 Reference to drawings.

When there are drawings, there shall be a brief description of the several views of the drawings and the detailed description of the invention shall refer to the different views by specifying the numbers of the figures and to the different parts by use of reference letters or numerals (preferably the latter).

§ 1.75 Claim(s).

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

(b) More than one claim may be presented provided they differ substantially from each other and are not unduly multiplied.

(c) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes under § 1.16, a multiple dependent claim will be considered to

be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. In addition to the other filing fees, any original application which is filed with, or is amended to include, multiple dependent claims must have paid therein the fee set forth in § 1.16(d). Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a).)

(2) See §§ 1.141 to 1.146 as to claiming different inventions in one application.

(e) Where the nature of the case admits, as in the case of an improvement, any independent claim should contain in the following order:

(1) A preamble comprising a general description of all the elements or steps of the claimed combination which are conventional or known,

(2) A phrase such as "wherein the improvement comprises," and

(3) Those elements, steps and/or relationships which constitute that portion of the claimed combination which the applicant considers as the new or improved portion.

(f) If there are several claims, they shall be numbered consecutively in Arabic numerals.

(g) The least restrictive claim should be presented as claim number 1, and all dependent claims should be grouped together with the claim or claims to which they refer to the extent practicable.

(h) The claim or claims must commence on a separate sheet.

DEFENDANT'S

EXHIBIT 15

EXPERT REPORT OF JONATHAN P. HOW, PH.D.

I. Qualifications:

I am a tenured Associate Professor at the Massachusetts Institute of Technology ("MIT") in the Aeronautics and Astronautics Engineering Department, and have been a professor in that department since 2000. From 1994 until accepting my current post with MIT, I served as an Assistant Professor at Stanford University in the Aeronautics and Astronautics Engineering Department. My principal fields of interest are navigation and control. I earned Ph.D. and S.M. degrees from MIT and a B.A.Sc. degree from the University of Toronto.

My current and past professional service on professional boards, journals, and panels in the educational, governmental, and private sectors, includes:

- Editorial Board – Elsevier Astrodynamics Books Series;
- Associate Editor – AIAA Journal of Guidance Control and Dynamics;
- NSF Panel Review (Civil and Mechanical Systems);
- International Federation of Automatic Control (IFAC) Technical Committee on Aerospace;
- IEEE Aerospace Controls Technical Committee.

My professional organizational memberships include:

- Associate Fellow of American Institute Aeronautics and Astronautics (AIAA);
- Senior Member of Institute of Electrical and Electronics Engineers (IEEE); and
- Member of Institute of Navigation (ION).

I have authored numerous articles on navigation and controls and am a frequent lecturer at various conferences. My complete curriculum vitae is attached as DX 9 to the Markman Claim Construction Brief filed by L3 Communications Systems, Inc. ("L3"). My curriculum vitae of DX 9 list all publications I have authored within the last ten years.

I have been retained by L3 as an expert witness in this matter and asked to provide opinions relating to the manner in which a person skilled in the field of aviation electronic flight instrument systems would interpret terms and information appearing in U.S. Patent No. 5,841,018. I have not testified as an expert, either at trial or by deposition, in any other cases within the last four years.

I am being paid at a rate of \$175 per hour for time I spend working on this expert witness project, and am to be paid at a rate of \$250 per hour for court time.

II. Expert Opinion

I have studied U.S. Patent No. 5,841,018 (“the ‘018 patent”), as well as portions of the prosecution history of the ‘018 patent that were attached to Defendant’s Markman Claim Construction Brief filed by L-3 Communications Avionics Systems, Inc. (“L3”). I have also studied Defendant’s Markman Claim Construction Brief filed by L-3 and its attachments, as well as the Plaintiff’s Opening Markman Brief filed by Avidyne Corporation (“Avidyne”) and the Expert Report of Dr. M. Kaplan attached thereto as Exhibit 3 and other attachments. My opinions are based upon my education and experience, the ‘018 patent, and the attachments to the briefs of L3 and Avidyne. Although I have reviewed the brief of L3 and the brief of Avidyne, and in particular the differing interpretations presented in those briefs, my opinions are not directly based on those briefs or arguments, other than to the extent I offer that my opinion agrees or disagrees with one or more of those interpretations.

A. '018 Patent Claim Term Meanings

Based on my review of the '018 patent disclosure, it is my opinion that a person of ordinary skill in the field of aviation electronic flight instrument systems would understand the following regarding the disputed claim terms:

i). (Claim 1 and 16): Attitude Determining Device:

The term “attitude determining device” as it appears in the '018 patent is not a common or standard term in the industry. Recognized or commonly used names for devices that are used to provide attitude information include inertial measurement unit (“IMU”), inertial reference unit (“IRU”), inertial navigation system (“INS”), and attitude heading and reference system (“AHRS”). The term “attitude determining device” is descriptive and an apt name that is readily understandable as being a generic reference to equipment used to provide attitude information. In my opinion there would be no universal understanding of the internal components that would make up this class of devices.

In my opinion, Avidyne’s and Dr. Kaplan’s proposed construction that requires an attitude determining device to include “sensors” and “a processor” is unduly limiting. For example, an attitude determining device need not include a processor, may include a single processor, or may contain multiple processors. Further, although claim 16 recites “a processor of said device,” an attitude determining device need not be limited to the inclusion of just a single processor. For example, multiple processors may be included within an attitude determining device for processing separate signals from various disparate components. That claim 16 refers to a processor while claim 1 does not would be further indicative that an attitude determining device is not limited to the inclusion of a

processor. It is also true that the processing of the measured signal data may be performed by a completely separate processor. As discussed in the '018 patent, an attitude determining device may also include sensors the output of which do not require "processing" in order to provide attitude information such as, for example, level sensors that may directly output pitch and roll information. (DX 1, Col. 5:7-10).

It is my opinion that Avidyne's and Dr. Kaplan's proposed construction for the term "attitude determining device" is overly restrictive and a person skilled in this field would not interpret an attitude determining device as necessarily having those internal subcomponents, but rather would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of "attitude determining device" is interpreted as "a piece of equipment that determines angular orientation relative to the earth frame and is used to establish the attitude of a craft."

ii). (Claim 1 and 16): Compensating for Installation Orientation of an Attitude Determining Device:

The clause "compensating for installation orientation of an attitude determining device" as appears in the introduction of claims 1 and 16, in my opinion, would be understood by a person skilled in this field to provide a requirement of the patented method in that it provides the basis for performing the listed steps as a cohesive process and introduces various aspects of the method, such as the attitude determining device, mobile craft, reference coordinate system of the craft and earth frame coordinate system. In my opinion a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of "compensating for installation orientation of an attitude determining device" is interpreted as "adjusting to neutralize the effect of the orientation of an attitude determining device as installed."

iii). (Claim 1 and 16): Sensing the Installation Orientation of said Attitude Determining Device with respect to said Earth Frame Coordinate System when said Craft is at rest to obtain a Static Orientation Measurement of said Device:

In my opinion, a person skilled in this field would not interpret the above noted claim language of claims 1 and 16 as including the requirement of either “determining” or “automatically” as proposed by Avidyne and Dr. Kaplan. While it is possible that an attitude determining device could automatically detect its installation orientation, sensing equipment may also be configured to detect a stimulus only after receiving a command signal. In addition, the act of “sensing” does not have to result in a “determining” as suggested by the construction proposed by Avidyne and Dr. Kaplan. Still further, “angular orientation” as proposed by L3 is a more accurate description than “angular position” as proposed by Avidyne and Dr. Kaplan considering the functional operation of an attitude determining device. The proposal of “position” in this context is inaccurate.

Based on the foregoing and my understanding of the ‘018 patent, it is my opinion that the construction proposed by Avidyne and Dr. Kaplan for this claim requirement is overly narrowed. In my opinion a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of “sensing the installation orientation of said attitude determining device with respect to said earth frame coordinate system when said craft is at rest to obtain a static orientation measurement of said device” is interpreted as “detecting an angular orientation with the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of said device.”

iv). (Claim 1 and 16): Measuring an Attitude of said Mobile Craft with said Attitude Determining Device:

In my opinion, a person skilled in this field would not understand from the ‘018 patent that this claim requirement mandates “processing the output of the sensors . . . to

determine a pre-compensated attitude of the mobile craft” as proposed by Avidyne and Dr. Kaplan. While it is possible that an attitude determining device may be constructed to operate in such manner, it is not required to so operate.

The output of “sensors” associated with devices used to provide attitude information is typically in volts. Computational operations utilizing these voltage signals need not be performed to first determine a pre-compensated attitude of the craft with subsequent further computational operations performed to obtain a compensated attitude of the craft, as also discussed in the following section relating to the compensating requirement. For example, computational operations utilizing such voltage signals may be performed that directly result in compensated attitude information of the craft without the intermediary step suggested by Avidyne and Dr. Kaplan.

It is my opinion that the claim construction proposed by Avidyne and Dr. Kaplan is unduly limiting, and that a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of “measuring an attitude of said mobile craft with said attitude determining device” is interpreted as “using the attitude determining device to measure an angular orientation of the mobile craft.”

v). (Claim 1): Compensating said Craft Attitude Measurement of said Device with said Static Orientation Measurement to obtain Attitude Information of said Craft’s Reference Coordinate System with respect to said Earth Frame Coordinate System:

In my opinion there is no requirement that this claim operation must only be performed in the sequential order proposed by the construction of Avidyne and Dr. Kaplan, and in my opinion a person skilled in this field would not interpret this claim requirement as being limited to the order proposed by Avidyne and Dr. Kaplan.

As previously discussed, operations as are called out in the claim and utilizing voltage signals of sensors may be performed that result in compensated attitude information of the craft without an intermediary step of determining a pre-compensated attitude. The '018 patent itself suggests such an embodiment when referring to the use of rate sensors to compute pitch and roll attitude angles of a moving craft. (DX 1, Col. 4:51-54).

It is my opinion that the claim construction proposed by Avidyne and Dr. Kaplan is unduly restrictive, and in my opinion a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of “compensating said craft attitude measurement of said device with said static orientation measurement to obtain attitude information of said craft’s reference coordinate system with respect to said earth frame coordinate system” is interpreted as “using the static orientation measurement to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain the orientation of the craft relative to the earth.”

vi). (Claim 16): Storing said Static Orientation Measurement in a Memory:

The term “persistently” proposed by Avidyne and Dr. Kaplan for this claim requirement suggests the maintaining of data for a long time, in some form of memory that may be unalterable. This term, or the requirement of “persistently” maintaining this information, does not appear in the '018 patent or that part of the prosecution history that was attached to L3’s brief. Further, the '018 patent discloses an embodiment in which data is stored in a memory that is not “non-volatile” so that the static orientation measurement must be re-obtained each time power is turned on. (DX 1, Col. 5:45-50). I also note that digitized data may be stored within an electronic device in numerous forms, such as a constant embedded within an encoded computational operation. It is my opinion that the construction proposed by Avidyne and Dr. Kaplan for this term is unduly

restricted and that a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of “storing said static orientation measurement in a memory” is interpreted as “retaining static orientation measurement data within the attitude determining device.”

vii). (Claim 16): Retrieving said Static Orientation Measurement from said Memory to a Processor of said Device:

A device for obtaining attitude information, as previously discussed, need not be limited to having only one processor. Correspondingly, the ‘018 patent does not direct that an attitude determining device must include only a single processor. Any suggestion that this claim requirement contemplates only a single processor is inaccurate. Further, the inclusion of the term “feeding” in the construction proposed by Avidyne and Dr. Kaplan implies that static orientation data must be stored remotely from a processor. As also previously noted, digitized data may be stored within an electronic device in numerous forms, including as data embedded within an encoded computational operation that may itself be, or be part of, a processor. Therefore, as understood in light of the ‘018 patent, it is my opinion that the construction proposed by Avidyne and Dr. Kaplan for this term is unduly limiting, and in my opinion a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of “retrieving said static orientation measurement from said memory to a processor of said device” is interpreted as “providing static orientation measurement data to an electronic computational device within the attitude determining device.”

viii). (Claim 16): Compensating said Craft Attitude Measurement with said Retrieved Static Orientation Measurement in said Processor to obtain Attitude Information of said Craft's Reference Coordinate System with respect to said Earth Frame Coordinate System:0

In like manner to the compensating clause of claim 1, there is no indication in the '018 patent and the parts of the prosecution history attached to L3's brief that this claim requirement must only be performed in the sequential order proposed by the construction of Avidyne and Dr. Kaplan.

Again, operations as are called out in the claim and utilizing voltage signals of sensors may be performed that result in compensated attitude information of the craft without an intermediary step of determining a pre-compensated attitude as suggested by Avidyne and Dr. Kaplan. Such an embodiment is suggested by the '018 patent itself when referring to the use of rate sensors to compute pitch and roll attitude angles of a moving craft. (DX 1, Col. 4:51-54).

It is my opinion that the claim construction proposed by Avidyne and Dr. Kaplan is unduly restrictive, and in my opinion a person skilled in this field would interpret this claim requirement in the manner proposed by L3, repeated as follows:

The claim requirement of "compensating said craft attitude measurement with said retrieved static orientation measurement in said processor to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system" is interpreted as "using the static orientation measurement data in an electronic computational device to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain an orientation of the craft relative to the earth."

October 13, 2006

Jonathan P. How
Jonathan P. How

DEFENDANT'S

EXHIBIT 16

EXPERT REPORT OF GARY S. WATSON

I. Qualifications

A. Education:

B.S.E.E., *cum laude*, Bradley University, Peoria, Illinois (1977).

B. Professional Career:

1992 – Present: L3 Communications Avionics Systems, Inc. (“L3”)

- Positions held include: Program Manager, Customer/Certification Manager, and Vice President of Engineering.

1977 – 1992: Allied Signal – Bendix King Avionics Division

- Positions held include: Product Line Manager, Hangar Operations Manager, and U.S. Sales Manager.

C. United States and Foreign Patents:

I am a named inventor on the following United States Patents:

- U.S. Patent No. 5,841,018 for a Method of Compensating for Installation Orientation of an Attitude Determining Device Onboard a Craft (“the ‘018 patent”);
- U.S. Patent No. 5,595,357 for an Aircraft Stall Warning System;

D. Professional Organization Memberships:

- General Aviation Manufacturers Association (GAMA);
 - Chairman - Avionics and Electronic Systems Sub-Committee (1996-2003).

My duties as an employee of L3 do not regularly involve giving expert testimony.

II. Expert Opinion

As a co-inventor of U.S. Patent No. 5,841,018 (“the ‘018 patent”) I am familiar with the disclosure, claims, and prosecution history of the ‘018 patent. I have studied “Defendant’s Markman Claim Construction Brief” filed by L3 and “Plaintiff’s Opening Markman Brief” filed by Avidyne Corporation (“Avidyne”). In addition, I have reviewed

the exhibits attached to the brief filed by L3, and the “Expert Report of Marshall H. Kaplan, Ph.D.” accompanying Avidyne’s brief as Exhibit 3. The opinions I express below are based on my education, experience, and knowledge of the ‘018 patent, as well the various documents that I reviewed that were filed by L3 and Avidyne.

A. ‘018 Patent Claim Term Meanings

With respect to the disputed claim terms, based on my experience and knowledge of the ‘018 patent, it is my opinion that a person of ordinary skill in the field of aviation electronic flight instrument systems would understand the following:

i). (Claims 1 and 16): Attitude Determining Device:

Dr. Kaplan and Avidyne suggest that term “attitude determining device” must be interpreted to include “sensors” and “a processor.” It is my opinion that a person of ordinary skill in the field would consider this an inaccurate definition.

Prior to filing the ‘018 patent I was not aware of the term “attitude determining device” being used in the industry, which term is still not regularly used to my knowledge in the field. The term is used in the ‘018 patent as a broad, generic term to describe the function of the device and not to designate specific structural components. One standard name in the field at the time of filing the ‘018 patent for devices used to obtain attitude data was “inertial reference unit” or IRU, as noted in the ‘018 patent. (DX 1, Col. 3:24-26). This term is still widely used in the field. There were other devices used to obtain attitude data which were commonly known and used in the field, such as devices referred to by the names and acronyms inertial measurement unit (IMU), inertial navigation system (INS), and attitude heading and reference system (AHRS).

As expressed in the '018 patent, an attitude determining device may be configured using various components, including rate sensors, gimballed instruments, accelerometers, level sensors, processors, and with or without non-volatile memory. While claim 16 includes the requirement of "a processor," claim 1 does not reference such a processor, suggesting that claim 1 should not be restricted to requiring a component of claim 16 that is not contained in claim 1. Claim 16 is also not limited to the inclusion of just a single processor. The previously mentioned level sensors, as also discussed in the '018 patent, do not even require "processing" to transmit attitude data. (DX 1, Col. 5:7-10).

In view of the disclosed embodiments of an attitude determining device and further potential configurations, it is my opinion that the proposed construction of this term by Dr. Kaplan and Avidyne would be understood by a person of ordinary skill in the field to be improperly limited. It is my opinion that such a person would understand this claim requirement in the following manner:

The claim requirement of "attitude determining device" is interpreted as "a piece of equipment that determines angular orientation relative to the earth frame and is used to establish the attitude of a craft."

ii). (Claims 1 and 16): Compensating for Installation Orientation of an Attitude Determining Device:

In my opinion, a person skilled in the field would understand the introductions of claims 1 and 16, including the term "compensating for installation orientation of an attitude determining device," as being necessary to define the method as a whole and as identifying various essential features of the invention. The identified features necessary to the invention including "attitude determining device," "mobile craft," "reference coordinate system of the craft," and "earth frame coordinate system." Those features are required to accomplish the invention that is partially defined in the introduction of claims

1 and 16 as “[a] method of compensating . . . to obtain attitude information of said craft from said device based on an earth frame coordinate system.” The method compensates for the orientation of the device as installed in the craft. As such, it is my opinion that a person skilled in this field would understand the introductory claim term “compensating for installation orientation of an attitude determining device,” in the following manner:

The claim requirement of “compensating for installation orientation of an attitude determining device” is interpreted as “adjusting to neutralize the effect of the orientation of an attitude determining device as installed.”

iii). (Claims 1 and 16): Sensing the Installation Orientation of said Attitude Determining Device with respect to said Earth Frame Coordinate System when said Craft is at rest to obtain a Static Orientation Measurement of said Device:

Dr. Kaplan and Avidyne suggest that this claim term involves “automatically determining the angular position.” It is my opinion that a person skilled in the field of aviation electronic flight instrument systems would not interpret this term in such a manner.

An attitude determining device may be designed to “sense” its installation orientation in response to a control signal. For example, a warm-up period after start-up may be required for instrument stabilization prior to “sensing.” A manually input command signal may also be required prior to “sensing.” Furthermore, an attitude determining device operates to sense its *orientation* relative to earth frame, and not its *position*, which indicates a specific location.

It is my opinion that the required “automatically determining the angular position” proposed by Dr. Kaplan and Avidyne would be understood by a person of ordinary skill in the field as overly limited and I believe that such a person would interpret this claim requirement in the following manner:

The claim requirement of “sensing the installation orientation of said attitude determining device with respect to said earth frame coordinate system when said craft is at rest to obtain a static orientation measurement of said device” is interpreted as “detecting an angular orientation with the installed attitude determining device relative to earth frame while the craft is not moving to obtain a static orientation measurement of said device.”

iv). (Claims 1 and 16): Measuring an Attitude of said Mobile Craft with said Attitude Determining Device:

Dr. Kaplan and Avidyne propose that this claim term requires “processing the output of the sensors . . . to determine a pre-compensated attitude of the mobile craft.” It is my opinion that a person skilled in the field would not interpret this claim term to be restricted to such a narrow definition.

An attitude determining device performing electronic calculations involving sensor signals does not have to first “determine a pre-compensated attitude,” and then perform further calculations to obtain adjusted attitude information. As described in the ‘018 patent itself, signals from the sensors may be conventionally processed to obtain attitude information of the craft based on the earth frame coordinate system, without such signals being initially processed to first obtain a pre-compensated value, and subsequently re-processed to obtain a compensated value. (DX 1, Col. 4:50:54). Although it is possible to construct a device to function in the manner suggested by Dr. Kaplan and Avidyne, it is not the only way for such a device to function.

Therefore, it is my opinion that a person skilled in the field would understand the claim term to be broader than that suggested by Dr. Kaplan and Avidyne, and that such a person would interpret this claim requirement in the following manner:

The claim requirement of “measuring an attitude of said mobile craft with said attitude determining device” is interpreted as “using the attitude determining device to measure an angular orientation of the mobile craft.”

v). (Claim 1): Compensating said Craft Attitude Measurement of said Device with said Static Orientation Measurement to obtain Attitude Information of said Craft's Reference Coordinate System with respect to said Earth Frame Coordinate System:

Dr. Kaplan and Avidyne interpret this claim term as if compensating must be performed in only one specific sequence in which a pre-compensated attitude is fully determined and then a second operation is performed to arrive at a compensated attitude. A person skilled in the field, in my opinion, would not interpret this claim term to be limited to only proceeding in this order.

Attitude determinations may be made in which, for example, sensor output is used to directly calculate a compensated attitude without any intermediary step in which a “pre-compensated” attitude is initially determined. This situation is discussed in the ‘018 patent. (DX 1, Col. 4:50-54).

It is my opinion that a person skilled in the field would understand the proposal by Dr. Kaplan and Avidyne to only encompass one potential scenario, and would properly understand this claim requirement as follows:

The claim requirement of “compensating said craft attitude measurement of said device with said static orientation measurement to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system” is interpreted as “using the static orientation measurement to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain the orientation of the craft relative to the earth.”

vi). (Claim 16): Storing said Static Orientation Measurement in a Memory:

Nowhere in the ‘018 patent and prosecution history does the term “persistently” appear. It is unclear how Dr. Kaplan and Avidyne have arrived at this term, and what it means in relation to the ‘018 patent. Data, such as digitized electronic data, may be stored in computerized “memory” in a wide variety of forms and locations. Therefore, it

is my opinion that a person skilled in the field would consider the construction proposed by Dr. Kaplan and Avidyne to unnecessarily narrow a term having a broad meaning within the field. It is also my opinion that a person skilled in this field would understand this claim term as follows:

The claim requirement of “storing said static orientation measurement in a memory” is interpreted as “retaining static orientation measurement data within the attitude determining device.”

vii). (Claim 16): Retrieving said Static Orientation Measurement from said Memory to a Processor of said Device:

In my opinion, the proposed construction of Dr. Kaplan and Avidyne with regard to this term inaccurately implies the existence of only one processor within the attitude determining device. The ‘018 patent and prosecution history do not state or suggest that an attitude determining device must be constructed with only a single processor. Certainly attitude determining devices can be constructed to include multiple processors.

Also in my opinion, the “obtaining . . . and feeding” terms in the proposed construction of Dr. Kaplan and Avidyne inaccurately suggest that the static orientation measurement is stored separate and apart from the processor. For example, because electronic data may be stored in a wide variety of forms and locations, it should be appreciated that such data may be part of code that is maintained within a processor and simply accessed as needed.

It is my opinion that a person skilled in the field would understand the construction of Dr. Kaplan and Avidyne has overly narrowed and that such a person would understand the claim term as follows:

The claim requirement of "retrieving said static orientation measurement from said memory to a processor of said device" is interpreted as "providing static orientation measurement data to an electronic computational device within the attitude determining device."

viii). (Claim 16): Compensating said Craft Attitude Measurement with said Retrieved Static Orientation Measurement in said Processor to obtain Attitude Information of said Craft's Reference Coordinate System with respect to said Earth Frame Coordinate System;0

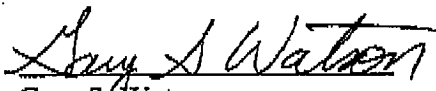
As with claim 1, Dr. Kaplan and Avidyne suggest that this claim requirement is mandated to be performed in a sequential order. It is my opinion that such a construction is inaccurate.

Calculations using digitized data may be conducted that generate compensated attitude information without having to initially calculate a pre-compensated attitude to which the static orientation measurement is applied. As previously mentioned, this is even discussed in the '018 patent itself regarding determination of pitch and roll attitude angles of a moving craft via rate sensors. (DX 1, Col. 4:51-54).

In my opinion, the proposed construction of Dr. Kaplan and Avidyne would be understood as overly restrictive and would further understand this claim term as follows:

The claim requirement of "compensating said craft attitude measurement with said retrieved static orientation measurement in said processor to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system" is interpreted as "using the static orientation measurement data in an electronic computational device to neutralize the craft attitude measurement for the installation orientation of the attitude determining device to obtain an orientation of the craft relative to the earth."

October 16, 2006


Gary S. Watson